WHAT IS CLAIMED IS:

1. An apparatus for ultrasonically detecting an edge of a web, comprising:

a ultrasonic-wave transmitter transmitting ultrasonic-wave pulse train;

a ultrasonic-wave receiver arranged in facing relation to said ultrasonic-wave transmitter, receiving said ultrasonic-wave pulse train, and converting the received ultrasonic-wave pulse train into electric signals, said web being fed between said ultrasonic-wave transmitter and said ultrasonic-wave receiver;

a rectifying circuit for rectifying said electric signals;

a low-pass filter circuit for smoothing output signals transmitted from said rectifying circuit;

a first sample-holding circuit for sampling an output signal transmitted from said low-pass filter circuit, at first timing;

a second sample-holding circuit for sampling an output signal transmitted from said low-pass filter circuit, at second timing later than said first timing;

a third sample-holding circuit for sampling an output signal transmitted from said first sample-holding circuit, at said second timing; and

a differentially amplifying circuit for calculating a difference between an output signal transmitted from said second sample-holding circuit and an output signal transmitted from said third sample-holding circuit.

2. The apparatus as set forth in claim 1, wherein said first and second timings are selected out of a period of time in which the smoothed electric signals linearly increase.

3. A method of ultrasonically detecting an edge of a web, by detecting cutoff of ultrasonic-waves transmitted from a ultrasonic-wave transmitter to a ultrasonic-wave receiver, said cutoff being caused by a web being fed between

said ultrasonic-wave transmitter and said ultrasonic-wave receiver, comprising:

converting ultrasonic-waves received by said ultrasonic-wave receiver, into electric signals, and rectifying said electric signals;

smoothing the thus rectified electric signals;

sampling the smoothed electric signals at first timing by means of a first sample-holding circuit;

sampling the smoothed electric signals at second timing later than said first timing by means of a second sample-holding circuit;

sampling an output signal transmitted from said first sample-holding circuit, at said second timing by means of a third sample-holding circuit; and

calculating a difference between an output signal transmitted from said second sample-holding circuit and an output signal transmitted from said third sample-holding circuit.

4. The method as set forth in claim 3, further comprising selecting said first and second timings out of a period of time in which the smoothed electric signals linearly increase.